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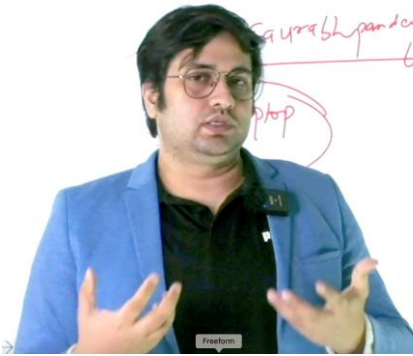

By saurabh Pandey

THE HINDU

Target Mains -2024/25 -

Q India's foreign policy approach has moved from non aligned to all aligned . Explain this statement in the context of India’s approach towards Quad and BRICS

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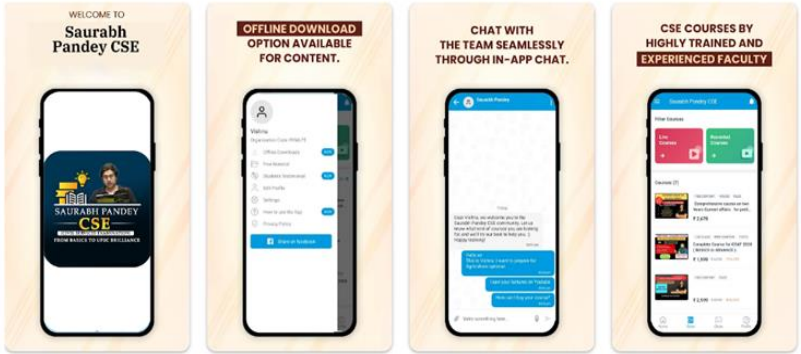

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BY SAURABH PANDEY SIR

Focus on female employment to counter unemployment

Indranil De

Professor, Institute of Rural Management Anand, Gujarat

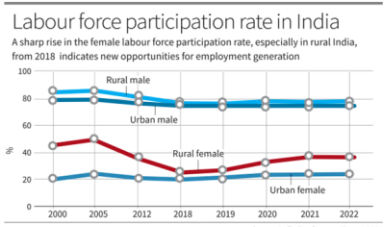
The difficulty in getting jobs and inflation were the two major issues that played a role in the results of the Lok Sabha Elections 2024, according to the Lokniti-CSDS pre-poll survey (*The Hindu*, April 11, 2024). The India Employment Report (IER) 2024, published by the Institute for Human Development and the International Labour Organization, also illustrated a rise in the unemployment rate from a little more than 2% in 2000 and 2012 to 5.8% in 2019. Unemployment reduced somewhat to 4.1% in 2022, although time-related underemployment was high at 7.5%. The labour force participation rate (LFPR) also fell from 61.6% in 2000 to 49.8% in 2018 but recovered halfway to 55.2% in 2022. But in this gloomy picture marked by unemployment and underemployment, there was a steep and steady upward trend of female LFPR from 24.6% in 2018 to 36.6% in 2022 in rural India. It also increased by around 3.5% from 20.4% in 2018 in urban areas. This is in contrast with male LFPR, which rose marginally by 2% in rural areas and almost stagnant in urban areas.

Female LFPR in India is low when compared to the world average of 53.4% (2019), and it has decreased from 38.9% in 2000 to 23.3% in 2018. Against this backdrop, the current increasing trend in female LFPR, especially a 12% rise in rural India during 2018-22, indicates an untapped opportunity for employment generation. Women have been engaged in unpaid family labour work in both rural and urban areas. While 9.3% of males were employed as unpaid family workers, the same was as high as 36.5% for females in 2022. Moreover, the difference between female and male unpaid family labour employment was 31.4% in rural areas against only 8.1% in urban areas. Hence, if appropriate strategies are taken, there is a much greater opportunity for female employment generation, especially in rural areas.

The choice of employment for earnings may be extremely gendered, which makes generating employment opportunities for females tricky. Our study on work conditions and employment for women in the slums of Bhuj, Gujarat, shows that women are more interested in engaging in traditional employment activities from home, such as *bandhani*, embroidery and fall beading, rather than other opportunities, including non-farm casual labour. The flexibility of work and the possibility of working from home were the major reasons for preferring traditional occupations despite their low income. The study also found that 30% of women were stuck to their traditional occupations due to the unavailability of other options. A lower rise of female LFPR in urban than rural areas during 2018-22, as shown in IER 2024, also indicates a lack of appropriate and gainful opportunities for females in urban areas. The opportunity to develop one's own enterprise was difficult due to limited access to capital and binding social norms where males of a particular community control the dominant business of the locality – tie and dye. Collectivising women under self-help groups (SHG), and, further, through federations may benefit women involved in traditional occupations. SHG women may be trained to acquire new skills, and federations may link women directly to the market for better returns. The Kutch Mahila Vikas Sangathan (KMVS), a local non-profit organisation, is working in the region towards this end.

Traditional occupations are accepted by society as they conform to local gender norms. These occupations have emerged as the dominant choice of women. Traditional occupations support women's practical gender needs, such as managing both household work and earnings. However, they may not help in meeting strategic gender needs, such as challenging regressive gender norms. Moving out of their own dwelling and working in a professional environment increases women's agency and empowers them to meet strategic gender needs.

A better female labour force participation rate can improve overall family income and welfare, especially in rural India



The importance of market access

The foray of women into male-dominated workspaces would increase competition for labour work. This competition can be avoided by generating new opportunities in previously neglected arenas. In a study on the relationship between the type of dominant irrigation source of a region (canal or groundwater) and women's empowerment (farm employment and decision-making abilities) in the villages in the Upper Gangetic Plains of Uttarakhand and Uttar Pradesh, we found that women's wages in farm labour work and decision-making abilities increased with the expansion of relatively less dominant source of irrigation and vice versa. Males may take more interest if more water is available through the dominant source of the region. Further, the expansion of canal irrigation during *Ziad* (summer slump season), when males had less interest in agriculture, positively affected female empowerment.

Additional non-conventional irrigation benefits women, as this writer's recent field visits to villages in West Bengal showed. Women have initiated farming, pisciculture, nursery and vermicompost after water is made available through ponds or tube wells in arid and monocropped regions. These women are part of an all-women water user's association supported by the West Bengal Accelerated Development of Minor Irrigation Project, Government of West Bengal. Availability of work near home has reduced female migration with the whole family and has increased family welfare. Male family members help in heavy activities that demand strength, such as ploughing or netting in ponds. In most tribal villages, women are barred from ploughing due to gender norms. Similar norms exist for netting in ponds. Women said that they could carry on without the help of male family members if they used hired tractors for ploughing and hired labour for netting. More market interaction empowers women by enabling them to circumvent gender norms and reduce dependency on male family members. Far away, in the Upper Gangetic Plains, a more vibrant water market was found to be associated with higher agency by women to influence the purchase of agricultural inputs.

The earnings of both men and women contribute to family income and welfare. Hence, the strategy to enhance women's workforce participation and reduce underutilisation of time can be possible by developing income-earning opportunities where males need not be confronted and driven out of the labour market. Women's work opportunities at or near home can enhance the family income and women's position in the family. Strikingly, a woman in West Bengal was proud that she could lend money to her husband to buy agricultural inputs. In another study in the slums of Kolkata, it was observed that women's participation in the workforce has reduced economic vulnerability and improved resilience during the COVID-19 pandemic.

Need for a better work environment

At the same time, participation in work outside the home should be focused. This has a more direct impact on women's empowerment. However, a long-term strategy is required to develop a better work environment for women. Safety and basic facilities in the workplace (toilets and crèches) should be made available. Public policy should mandate these facilities in small- and medium-manufacturing or business units.

A strategy of focusing on the improvement of female LFPR would improve overall employment and the family income. In rural areas, public policy should help women by providing more access to resources (such as water) and markets (to buy inputs and implements and to sell produce). In urban areas, better facilities in the workplace should be mandated. Collectivising women and federating collectives in rural and urban India under planned economic activities will be most helpful. The *Lakhpati Didi* programme aiming at raising an SHG woman's annual income to ₹1 lakh or above may pave the way.

The views expressed are personal

Female employment

- Female LFPR in India is low when compared to the world average of 53.4% (2019), and it has decreased from 38.9% in 2000 to 23.3% in 2018.
- Against this backdrop, the current increasing trend in female LFPR, especially a 12% rise in rural India during 2018-22, indicates an untapped opportunity for employment generation.
- Women have been engaged in unpaid family labour work in both rural and urban areas.
- While 9.3% of males were employed as unpaid family workers, the same was as high as 36.5% for females in 2022.
- Moreover, the difference between female and male unpaid family labour employment was 31.4% in rural areas against only 8.1% in urban areas

- **The study also found that 30% of women were stuck to their traditional occupations due to the unavailability of other options.**
- **The opportunity to develop one's own enterprise was difficult due to limited access to capital and binding social norms where males of a particular community control the dominant business of the locality — tie and dye.**
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BIG SHOT

A drone view shows thousands of dead fish killed by contamination in the environment protection area of Taqua on the Piracicaba river in the state of Sao Paulo, Brazil on Thursday. REUTERS

The Piracicaba River

- Tons of dead fish are rotting in the Piracicaba River in Sao Paulo state downstream from where local authorities say a sugar and ethanol plant dumped industrial waste this month.
- **The Piracicaba River** is a river of São Paulo state in southeastern Brazil. It is a tributary of the Tietê River, which it joins in the reservoir created by Barra Bonita Dam.

WHAT IS IT?

Dyson sphere: an energy devourer

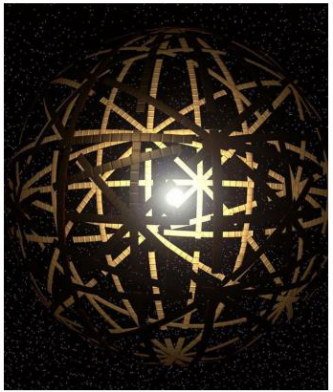
Arkatapa Basu

Imagine you are an astronomer looking deep into space in search of extraterrestrial life. You spot a star that is emitting infrared radiation in anomalous fashion. You zoom in and see a swarm of solar panels covering the star like a shell, quietly collecting an enormous amount of solar energy from the star. Et voila: you have found a Dyson sphere.

The Dyson sphere is named after theoretical physicist Freeman Dyson (1923-2020), who hypothesised its existence. He said that technologically advanced civilisations will have such a tremendous demand for energy that they will have to harness the entire radiative power of a star, using solar energy collectors arranged in a sphere around the orb.

Dyson also figured that these spheres would emit excess heat from the star as infrared radiation, which he said astronomers could look for as an indirect sign of intelligent life — especially life capable of building such megastructures.

Of course, not all unusual infrared radiation emissions are indicative of Dyson spheres. In May this year, scientists set out to look specifically for the signature of



Freeman Dyson said that technologically advanced civilisations will harness the entire radiative power of a star.

Dyson spheres. They scanned 5 million stars within 1,000 light years of the earth. After analysing this data, they found seven stars whose infrared radiation they could not explain. There is no conclusive evidence still, but might one of these seven stars have a Dyson sphere surrounding it?

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Dyson spheres

- Dyson spheres are hypothetical artificial megastructures built around a star to collect all of its radiant energy.
- In theory, detecting a Dyson sphere could be a way to find a technologically advanced alien civilization that did not wish to communicate.
- However, many challenges exist for both building and finding such Dyson spheres, also called Dyson swarms

- The idea behind a Dyson sphere is to collect as much energy from a star as possible.
- On Earth, the total amount of energy we receive from the sun — a value known as the total solar irradiance — is 1,361 watts per square meter, as measured by NASA's Solar Radiation and Climate Experiment.
- Yet that is just a tiny proportion of the sun's total energy output radiated in all directions, which is 380 billion quadrillion (3.86×10^{26}) watts every second, according to the Australian Space Weather Forecasting Centre. Because Earth is so small by comparison, we receive only a tiny proportion of this energy.

- Suppose, though, that an enterprising technological civilization wanted to make use of all their star's energy that would otherwise move off into space at the speed of light.
- If they had sufficiently advanced technology, they might build themselves a Dyson sphere — a spherical swarm of solar-energy collectors that would fully encapsulate their star and collect all of its energy.
- In 1960, physicist Freeman Dyson suggested that technological extraterrestrial civilizations might build a cloud of solar energy collectors that would completely surround their star and that would be detectable from its waste heat.

The importance of both Quad and BRICS

T.S. Tirumurti

Foreign Service Officer who was India's Permanent Representative to the UN, New York, and India's Sherpa for BRICS

The Quad Foreign Ministers' meeting in Japan end-July, after a long gap of 10 months, comes at a time when the United Nations Security Council (UNSC) is paralysed and its reform nowhere in sight, international law is violated with impunity both in the Ukraine war and in the assault on Gaza by Israel, an axis of Russia, China, North Korea, and Iran is gaining traction, and Chinese influence is growing not just in the Indo-Pacific, but elsewhere too.

The U.S. has, in turn, realised that it needs not just allies, but also credible partners in its security architecture, including in the Indo-Pacific, and reached "across the aisle" to "non-ally" countries like India to partner with them in smaller pluri-lateral groupings and joint security initiatives. Further, ASEAN countries are getting increasingly vulnerable, with South China Sea remaining a flashpoint.

While India is a member of many pluri-lateral groups on both sides of the geo-strategic "divide", its engagement in Quad and with BRICS present the country with interesting, and sometimes contrasting, dilemmas.

India has enthusiastically embraced Quad and its strategic objectives. U.S. President Joe Biden's belief in the Quad has given it the necessary fillip at the highest level since 2021. The fact that India, during its presidency of the UNSC in August 2021, held a high-level virtual event on 'Enhancing Maritime Security', presided over by Prime Minister Narendra Modi and attended by Russian President Vladimir Putin, among others, indicates the importance India attaches to strengthening maritime security in the Indo-Pacific and beyond.

India's role in the Quad

While Quad has always had a geopolitical security objective vis-à-vis China, India's vision goes beyond this narrow thrust to a much broader redrawing of the security and techno-economic architecture of the Indo-Pacific region. With Quad now working on reorientation of global supply chains of critical technologies and on a range of areas of direct strategic relevance to the region, including digital, telecom, health, power, and semi-conductors, it has underlined that development too has a security perspective which cannot be ignored. India, in its turn, has benefited through enhanced bilateral relations with Quad partners, especially the U.S.

On the other hand, the formation of AUKUS with the U.S., Australia, and the U.K., with a view to enhance their military capabilities, especially Australia's with nuclear submarines, has put securitisation of the Indo-Pacific region and deterrence of China at the centre. The Ukraine war and enhanced focus on NATO has made the West look at Asia too through a military lens. AUKUS may well suit India's geo-strategic interests, but India's reluctance to go the whole nine yards in embracing a purely security vision for Quad is seen as a dampener, in spite of the Indian External Affairs Minister clarifying that Quad is not an Asian NATO and India is not a treaty ally unlike the other three. In fact, I used to tell my Quad colleagues in the UN that the only value-add we have in Quad is India. Instead of factoring in India's viewpoint, if they merely want to convert India to their cause, then they are wasting the opportunity to become inclusive and enhance their overall impact in the region, which includes developing countries with differing compulsions, not all of which are military-centric.

India's independent policy of close relations with Russia and calling for a diplomatic solution to the Ukraine war, both of which are frowned upon by the West, do not distract India from strengthening the Quad. Some Quad members and European countries are themselves enhancing their bilateral engagement with China, underlining their differing bilateral and regional compulsions.

Against the backdrop of India's enthusiastic engagement with Quad, its engagement with BRICS presents a different conundrum. India was an enthusiastic founder of BRICS. In fact, at the 10th annual summit of the BRICS in 2018 in Johannesburg, South Africa, it was Mr. Modi who reminded the leaders that BRICS was founded to reform the multilateral system and proposed for the first time his vision of "reformed multilateralism." However, India's participation in BRICS has fluctuated from enthusiastic to lukewarm. While BRICS' initiatives such as New Development Bank and the Contingent Reserve Arrangement have been pioneering, the attempt by China to use BRICS to grandstand and push its world view on the Global South and now, to push back the West has made India wary of giving BRICS a higher profile.

The potential of BRICS

India had, consequently, been reluctant to expand BRICS. In fact, in 2018, Mr. Putin too underlined his reluctance to expand BRICS by quoting former South African President Nelson Mandela: "After climbing a great hill, one only finds that there are many more hills to climb." But after Quad and the situation in Ukraine, Russia too realised the potential of BRICS, which includes pushing back the West, and lined up behind China. The change of guard in Brazil leaves India as the lone member to push back China. A reluctant India decided to accept BRICS's expansion than oppose it and now many more countries are reportedly waiting to join. Even if India has the best of bilateral relations with all the new members, we need to make sure it all adds up to support for India inside BRICS. For this, India cannot afford to be ambivalent about BRICS any more. To counter moves to take BRICS in a direction India does not like, we need to be more engaged, not less. With India being the only country common to both Quad and BRICS, the country cannot afford to downplay one for the other.

With India being the only country common to both Quad and BRICS and a founding member of both, it cannot afford to downplay one for the other

India and geo strategic divide

- **India is a member of many plurilateral groups on both sides of the geo-strategic “divide”, its engagement in Quad and with BRICS present the country with interesting, and sometimes contrasting, dilemmas.**
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- India, in its turn, has benefited through enhanced bilateral relations with Quad partners, especially the U.S.
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- A reluctant India decided to accept BRICS expansion than oppose it and now many more countries are reportedly waiting to join

GETTY IMAGES

What is a PC emulator, and why did Apple allow it on the App Store?

An emulator, as the name suggests, is a software that allows a computer device to emulate another software. The difference in how a device operates allows it to run and use software designed for other, previously, incompatible devices

Nabeel Ahmed

The story so far:

Apple approved a PC emulator for iOS for the first time this week. The move will allow users to run classic software, mostly games on iOS, iPadOS and visionOS. Earlier this year, Apple updated its App Store guidelines to allow retro game console emulators, mini games, and HTML5 mini apps on iPhones.

What is an emulator in PC?

An emulator, as the name suggests, is a software that allows a computer device to emulate another software. The difference in how a device operates allows it to run and use software designed for other, previously, incompatible devices.

For example, software designed for a Windows PC will have to be redesigned to run on macOS. This redesign will have to be done by developers, who may choose to not include all the functionalities available on Windows to Mac users.

An emulator can be used in this scenario to run software designed for Windows on macOS by emulating the design architecture of Windows. Emulators are commonly used to run applications designed for different operating systems, play video games from older consoles, and test software across different platforms.

Why did Apple allow emulators?

Apple, in the past, did not allow emulators on its platform. The Cupertino-based tech giant approved UTM SE, an app for emulating a computer, to run classic software and games. The move came weeks after the company rejected it and barred it from being notarised for third-party app stores in the European Union. The move may be an attempt by the company to shake off anti-trust allegations in the U.S. for operating as a monopoly and restricting certain gaming apps on its App Store and preventing competition.

Allowing emulators on its App Store could help the iPhone-maker ensure users do not use third-party app stores in the EU to download emulators.

Are PC emulators legal?

Emulators come in handy when testing and designing software, and they do not use proprietary codes. So, they are considered legal to use. However, sharing copyrighted ROMs (Read Only Memory) online is illegal.

But, as most emulators are used to running software not originally meant for a particular device, the question of legality becomes complicated.

Using an emulator is considered legal if users own the software they are running on the emulator. However, if they use the emulator to run pirated copies of a software or use the emulator to distribute or download ROMs of software they do not own, it is considered illegal.

Are emulators risky?

Unlike proprietary software, which receives timely updates to ensure smooth and secure functions, using an emulator can be a risky proposition. Especially, if the emulator is downloaded from unofficial sources. These can contain malware that can compromise the security of a system.

Additionally, depending on the software users choose to emulate, they may inadvertently end up violating licensing agreements or copyright laws. This can result in refusal by the Original Equipment Manufacturer (OEM) to provide maintenance, or technical support and even lead to users being penalised for using proprietary ROMs.

Emulators can also impact the performance of a device. They are resource-intensive and may lead to decreased CPU performance, overheating, and potential damage to the battery. Additionally, poorly designed and untested emulators may lead to data corruption, especially if the emulator crashes or if there are combability issues with the ROMs or software being used.

Are emulators banned?

Due to their ability to help developers use different operating ecosystems for testing purposes without having to switch hardware or the underlying software, emulators are not typically banned in any country. However, the legal status of emulators depends on specific laws in each country, and on how they are used in that jurisdiction.

Are emulators legal in India?

In India, the laws do not specifically ban the use of emulators. However, their use is subject to copyright and intellectual property laws.

While it is legal to use and distribute emulators in India, users may land in trouble if they use emulators to run software such as games, operating systems, or applications without the proper licences or ownership. Distributing ROMs without proper ownership can be problematic.

Additionally, the concept of fair use applies if users own an original copy of the software and are using the emulator as a backup.

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Show of strength

Majestic cruise: Warships sail along the Neva river during a naval parade rehearsal in St. Petersburg on Sunday. Russia will celebrate Navy Day on July 28, the last Sunday of July by tradition. AP

Neva river

- The Neva is a river in northwestern Russia flowing from Lake Ladoga through the western part of Leningrad Oblast to the Neva Bay of the Gulf of Finland.
- Despite its modest length of 74 kilometres, it is the fourth-largest river in Europe in terms of average discharge

Turkish delight

Turkish fighter jets fly over a warship off the city of Kyrinia, in the self-proclaimed Turkish Republic of Northern Cyprus, as part of the 50th anniversary celebrations of July 20 Peace and Freedom Day, marking the Turkish invasion of the Mediterranean island. AFP

City of Kyrenia

- Kyrenia is a city on the northern coast of Cyprus, noted for its historic harbour and castle.
- It is under the *de facto* control of Northern Cyprus.
- While there is evidence showing that the wider region of Kyrenia has been populated before, the city was built by the Greeks named Achaeans from the Peloponnese after the Trojan War (1300 BC).

Animals acquire genes from bacteria that can produce antibiotics

The Hindu Bureau

A group of small, freshwater animals protect themselves from infections using antibiotic recipes "stolen" from bacteria, according to a new study. The tiny creatures are called bdelloid rotifers, which means 'crawling wheel-animals'. They have a head, mouth, gut, muscles and nerves like other animals, though they are smaller than a hair's breadth.

When these rotifers are exposed to fungal infection, the study found, they switch on hundreds of genes that they acquired from bacteria and other microbes. Some of these genes produce resistance weapons, such as antibiotics and other antimicrobial agents, in the rotifers. The findings were published in the journal *Nature Communications*.

Prior research found that rotifers have been picking up DNA from their surroundings for millions of years, but the new study is the first to discover them using these genes against diseases. No other animals are known to "steal" genes from microbes on such a large scale.

"These complex genes – some of which aren't found in any other animals – were acquired from bacteria but have undergone an evolution in rotifers," coauthor David Mark Welch, senior scientist and director of the Josephine Bay Paul Center at the Marine Biological Laboratory says in a release. "This raises the potential that rotifers are producing novel antimicrobials that may be less toxic to animals, including humans, than those we develop from bacteria and fungi."

"When rotifers were challenged with a fungal pathogen, horizontally acquired genes were over twice as likely to be upregulated as other genes – a stronger enrichment than observed for abiotic stressors," the authors write. "Among hundreds of upregulated genes, the most markedly overrepresented were clusters resembling bacterial polyketide and nonribosomal peptide synthetases that produce antibiotics. Upregulation of these clusters in a pathogen-resistant rotifer species was nearly ten times stronger than in a susceptible species."

Most of antibiotics are produced naturally by fungi and bacteria in the wild, and humans can make artificial versions to use as medicine. The study suggests that rotifers might be doing something similar. The scientists think that rotifers could give important clues in the hunt for drugs to treat human infections caused by bacteria or fungi. One problem with developing new drugs is that many antibiotic chemicals made by bacteria and fungi are poisonous or have side effects in animals.

bdelloid rotifers

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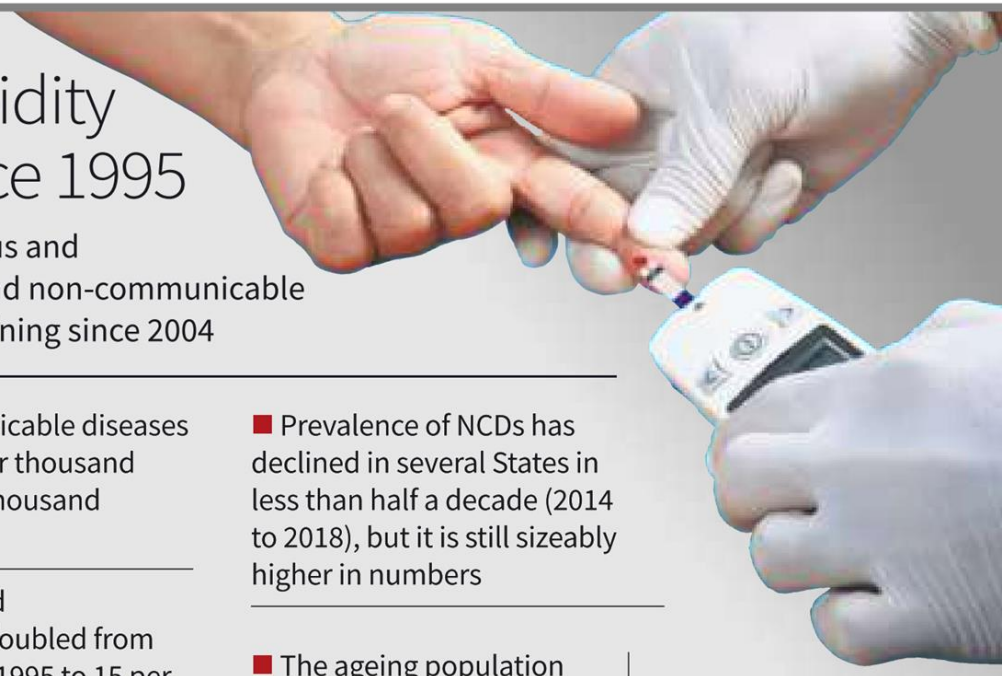
Marked morbidity transition since 1995

The prevalence of infectious and communicable diseases and non-communicable diseases have started declining since 2004



- Prevalence of non-communicable diseases (NCDs) has tripled from 8.6 per thousand individuals in 1995 to 30 per thousand individuals in 2018
- Prevalence of infectious and communicable diseases has doubled from 8 per thousand population in 1995 to 15 per thousand population in the past two decades
- Kerala has the highest prevalence of NCDs followed by Puducherry, Andhra Pradesh, Goa, Tamil Nadu, and Punjab. The north-eastern States have the lowest prevalence of non-communicable diseases
- Prevalence of NCDs has declined in several States in less than half a decade (2014 to 2018), but it is still sizeably higher in numbers
- The ageing population and rising life expectancy are concurrently fuelling the prevalence of NCDs without necessarily displacing existing infectious and communicable morbidities
- While NCDs burden has been higher in women than in men, it has tripled in both men and women between 1995 and 2014

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SPEAKING OF SCIENCE

D. Balasubramanian

We humans are affected by the cycle of light and darkness that occurs every day. Our bodies have a 24-hour (circadian) rhythm that is translated into physiological processes such as hormone secretion, which in turn drive our actions. To stay in synchrony with the environment, and therefore to perform the right activities at the right time, light serves as an alarm clock. This light synchronisation, photoentrainment, happens in the brain by light signals coming from the eye.

Many other species also depend on light to provide them with cues for their daily routine. When these light patterns are disrupted, their natural rhythms and behaviours can be affected. An example: tourism operators in the Maldives take boatloads of visitors out at night, and shine bright lights of about 4000 watts on the ocean surface. Biological activity in the water picks up as if it is morning, and tourists get to see whale sharks.

Our vision is enabled by the rods and cones, which are photoreceptor cells in the outer retina. The rods are very sensitive to light but are not colour sensitive and so are most useful in dim light; the cones work best in bright light, giving us colour vision. Rods and cones convert photons of light into electrical signals, which are passed on to retinal ganglion cells. These cells process information from the retina and pass it on to the brain.

A pattern of earlier sleep timing is associated with a lowered risk of major depressive disorder. FILE PHOTO

Photosensitive cells

About 20 years ago, a new class of cells that could perceive light was found in the inner retina. Called the intrinsically photosensitive retinal ganglion cells (ipRGC), these cells contain a photopigment, melanopsin, that allows them to directly respond to light. These cells have very important roles in our body's interaction with light that are not related to seeing.

Electrical impulses from the ipRGC travel to areas of the brain that are involved in sleep, alertness and mood regulation. Signals also project to the area of the brain that controls the pupils of the eyes, causing them to constrict in response to bright light.

Importantly, electrical signals travel to a part of the hypothalamus that regulates circadian rhythms. This part of the brain has long been known to be the master clock, where your body's internal clock is synchronised with the light-dark cycle in the outside world that is driven by the sun.

Morning birds

Morning diurnal preference is the classification for people who prefer early sleep and who rise early. Peak performance is earlier in the day, and the condition is associated with a reduced risk of obesity as well as better academic performance. Several studies have also shown that a pattern of earlier sleep timing is associated with a lowered risk of major depressive disorder (Scientific Reports, 12003, 2021).

Stanford neurobiology professor Andrew Huberman, in his popular podcast has pointed to the beneficial effects of low-angle light from the morning sun in resetting the circadian clock. ipRGC cells are most responsive to blue light (480 nm). The morning light has a low ratio of blue to yellow light, just enough to send a message to the hypothalamus marking the start of another circadian cycle. Sixteen hours later, your body is going to be sleepy. So go out and be in the morning light – sunny or cloudy, but don't stare at the sun! Synchronising your clock will improve your health – physical and mental.

(The article was written in collaboration with Sushil Chandani, who works in molecular modelling)

ipRGC)

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Rising antimalarial resistance in Africa needs urgent action

Artemisinin-based combination therapies (ACTs) have become the cornerstone of malaria treatment and control. However, the emergence and spread of artemisinin-resistance (ART-R) in malaria-causing Plasmodium falciparum parasites in eastern Africa has compromised the efficacy of these crucial treatments. To counter ART-R in Africa, researchers recommend using triple ACTs (TACTs), combining an artemisinin derivative with two partner drugs, which have proven effective in Asia.

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Spitting cobra venom reveals a promising antivenom

By studying the molecular characteristics of venom from spitting cobras, scientists have discovered that approved drugs called heparinoids can shield against the venom's destructive effects on local tissue. The study in cells and mice suggests that heparinoids could potentially be developed into antidotes for cobra bites. These compounds also don't require refrigeration like most antibody-based antivenoms, making heparinoids useful in remote regions that lack medical infrastructure.

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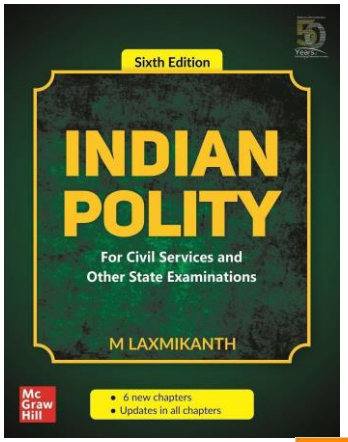

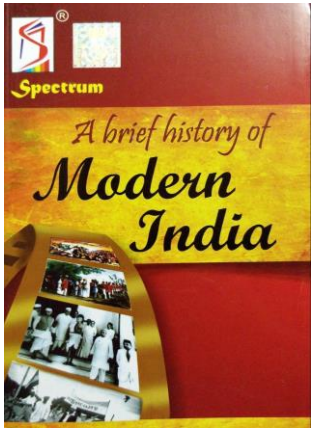

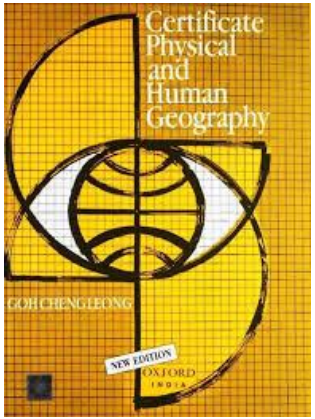

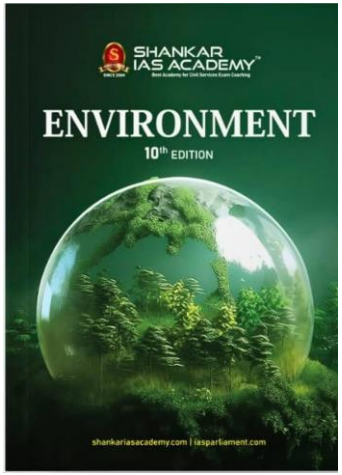

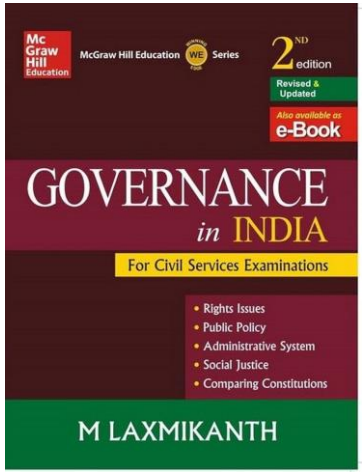

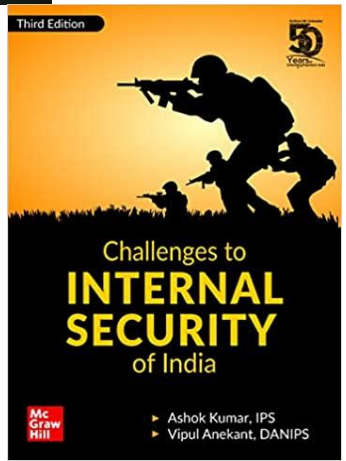

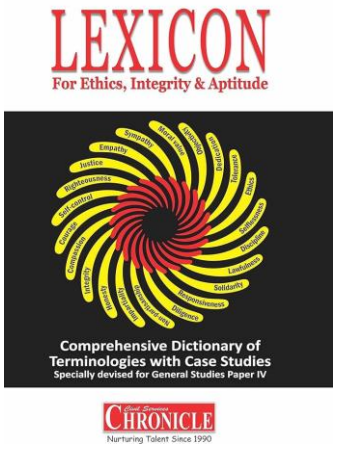

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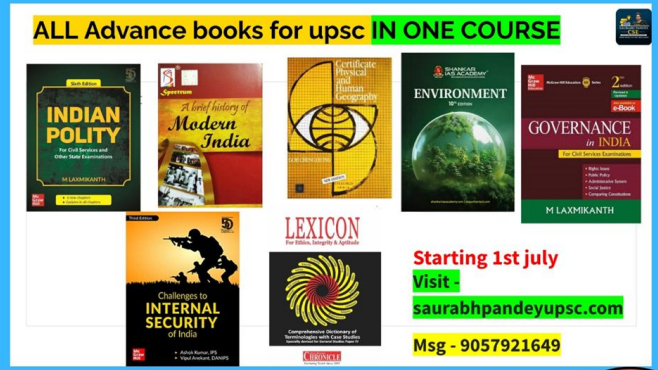

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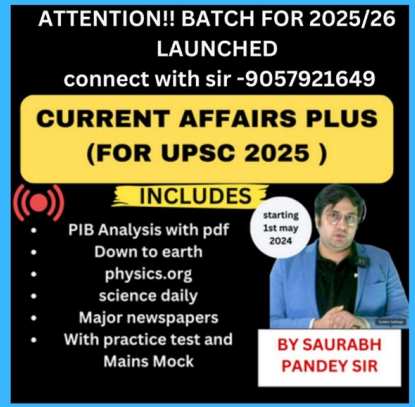

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